

What is claimed is:

1. A film bulk acoustic resonator, comprising:

an upper electrode;

5 a lower electrode; and

a piezoelectric film and at least one of an acoustic multilayer that are provided between the upper electrode and the lower electrode.

10 2. The film bulk acoustic resonator as claimed in claim 1, wherein the acoustic multilayer includes at least one pair made up of a first reflective film and a second reflective film composed of a material different from that of the first reflective film.

15 3. The film bulk acoustic resonator as claimed in claim 2, wherein a main component of the first reflective film is aluminum nitride (AlN), and a main component of the second reflective film is silicon oxide (SiO₂).

20 4. The film bulk acoustic resonator as claimed in claim 3, wherein the second reflective film is located at a piezoelectric film side in view of the first reflective film.

25 5. The film bulk acoustic resonator as claimed in claim 1, wherein the acoustic multilayer is interposed between the piezoelectric film and the upper electrode.

30 6. The film bulk acoustic resonator as claimed in claim

1, wherein the acoustic multilayer is interposed between the piezoelectric film and the lower electrode.

5 7. The film bulk acoustic resonator as claimed in claim 1, wherein the at least one of the acoustic multilayer includes a first acoustic multilayer and a second acoustic multilayer, the first acoustic multilayer being interposed between the piezoelectric film and the upper electrode, and the second acoustic multilayer being
10 interposed between the piezoelectric film and the lower electrode.

15 8. The film bulk acoustic resonator as claimed in claim 1, further comprising another acoustic multilayer provided between the lower electrode and a substrate.

20 9. The film bulk acoustic resonator as claimed in claim 2, further comprising another acoustic multilayer provided between the lower electrode and a substrate.

10. The film bulk acoustic resonator as claimed in claim 3, further comprising another acoustic multilayer provided between the lower electrode and a substrate.

25 11. The film bulk acoustic resonator as claimed in claim 4, further comprising another acoustic multilayer provided between the lower electrode and a substrate.

30 12. The film bulk acoustic resonator as claimed in claim 5, further comprising another acoustic multilayer

provided between the lower electrode and a substrate.

13. The film bulk acoustic resonator as claimed in claim
1, wherein a main component of the piezoelectric film is
5 zinc oxide (ZnO).

14. The film bulk acoustic resonator as claimed in claim
1, wherein a resonant frequency of the film bulk acoustic
resonator is 5 GHz or more.